

Special Program in Applied Mathematics and Applied Mechanics

Love for modelling and simulation

2013 - 12 - 11 (Wed.)

15:00 - 18:00

308, Mathematics Research Center Building (ori. New Math. Bldg.)

Modeling is a very important tool for scientific processes, requiring long-term dedication, desire, and continuous reflection. In this work, we discuss several aspects of modeling, and the reasons for doing it. We discuss two major modeling systems that have been built by us over the last 10 years. It is a long and arduous process but the reward of understanding can be enormous, as demonstrated in the examples shown in this work. We found that long-range transport of emerging Asian pollutants can be interpreted using a Lagrangian framework for wind analysis. More detailed processes still need to be modeled but an accurate representation of the wind structure is the most important thing above all others. Our long-term chemistry integrations reveal the capability of the IMS model in simulating tropospheric chemistry on a climate scale. These long-term integrations also show ways for further model development. Modeling is a quantitative process, and the understanding can be sustained only when theories are vigorously tested in the models and compared with high quality measurements. We should also not over look the importance of data visualization techniques. Humans feel more confident when they see things. Hence, modeling is an incredible journey, combining data collection, theoretical formulation, detailed computer coding and harnessing computer power. The best is yet to come.

